

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 60950-1, 2nd Edition, 2019-05-09 (Information Technology Equipment - Safety - Part 1: General Requirements) CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
<b>Complementary CCN:</b>	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
<b>Product:</b>	Power Supply, Built-In AC/DC
<b>Model:</b>	MTW15-51212, MTW15-51515 may be followed by a letter.
<b>Rating:</b>	<p>Input: 100 - 240 V ac, 0.45 - 0.25 A, 50 - 60 Hz</p> <p>Output: (MTW15-51212) +5 V dc, 2.0 A (3.0A peak) +12 V dc, 0.3 A (0.6A peak) -12 V dc, 0.2 A (0.3A peak) 16 W max. (Peak load is for 10 sec. max with total power not exceeding 16 W)</p> <p>Output: (MTW15-51515) +5 V dc, 2.0 A (3.0A peak) +15 V dc, 0.3 A (0.6A peak) -15 V dc, 0.2 A (0.3A peak) 17.5 W max. (Peak load is for 10 sec. max with total power not exceeding 17.5 W)</p>
<b>Applicant Name and Address:</b>	<p>TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER R&amp;D DIV 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA 940-1195 JAPAN</p>

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared By: Toshiyuki Suzuki / Project  
Handler

Reviewed By: Masatomo Takiyama / Reviewer

**Supporting Documentation**

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
  - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
  - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
  - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

**Product Description**

The products covered by this report are Switch Mode Power Supply intended for building-in.

**Model Differences**

Output rating, Transformer (T1) turn ratio, rating of SEC components.

**Test Item Particulars**

Mass of equipment (kg)	< 18
Equipment mobility	for building-in
Connection to the mains	N/A
Operating condition	continuous
Access location	operator accessible
Over voltage category (OVC)	OVC II
Mains supply tolerance (%) or absolute mains supply values	+10%, -10%
Tested for IT power systems	No
IT testing, phase-phase voltage (V)	N/A
Class of equipment	Class I (earthed)
Considered current rating of protective device as part of the building installation (A)	20
Pollution degree (PD)	PD 2
IP protection class	IP X0
Altitude of operation (m)	Up to 3000
Altitude of test laboratory (m)	Approximately 10 to 20

**Technical Considerations**

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 50°C
- The product is intended for use on the following power systems : TN

**Engineering Conditions of Acceptability**

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- Proper bonding to the end-product main protective earthing termination is : Not required
- The end-product Electric Strength Test is to be based upon a maximum working voltage of : MTW15-51212, Primary-Earthed Dead Metal/ Secondary: 291 Vrms, 598 Vpk; MTW15-51515., Primary-Earthed Dead Metal/ Secondary: 354.9 Vrms, 660 Vpk
- The following secondary output circuits are SELV : All outputs
- The following secondary output circuits are supplied by a Limited Power Source : The +12V and -12V outputs of model MTW15-51212, the +15V and -15V outputs of model MTW15-51515
- The power supply terminals and/or connectors are : Not investigated for field wiring
- The maximum investigated branch circuit rating is : 20 A
- The investigated Pollution Degree is : 2
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C) : T1 (Class B), L1 (120°C)
- The following end-product enclosures are required : Fire, Electrical
- The following output circuits are at ES1 energy levels : Outputs of all models
- The following output circuits are at PS2 energy levels : MTW15-51212, +12V and -12V output (LPS), MTW15-51515, +15V and -15V output (LPS)
- The following output circuits are at PS3 energy levels : 5V Output of all models
- Humidity conditioning has been conducted by tropical condition.
- Classification of PIS has not been conducted. Therefore, all electrical components and conductors including printed wirings were assumed to be arcing/resistive PIS.
- This component has been evaluated in "control of fire spread" method assuming appropriate fire enclosure is provided in end product. Unless the fire enclosure is made of non-combustible or V-0 material, the separation from the PIS shall be considered.
- Line to Line Capacitor (C1) may have variation in capacitance up to 0.22 µF. Therefore, consideration shall be given in controlling the capacitance value in the end-product application with respect to capacitance discharge issue.
- Primary to Ground Capacitor (C3) may have variations in capacitance up to 4700pF. Therefore, consideration shall be given in controlling the capacitance values in end product application with respect to touch current issue.

**Additional Information**

N/A

**Additional Standards**

The product fulfills the requirements of: The product fulfills the requirements of: UL 62368-1, 2nd Edition, 2014-12-01, CAN/CSA C22.2 No. 62368-1-14, 2nd Edition, 2014-12.

**Markings and Instructions**

Clause Title	Marking or Instruction Details
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Power rating - Company identification	Listee's or Recognized companys name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
Fuses - Rating	Rated current and voltage and type located on or adjacent to fuse or fuseholder.

<p>Printed Wiring Boards with QMJU2 Spray:</p>	<p>The following printed wiring boards have been evaluated for Annex A2 in combination with QMJU2 sprays</p> <ul style="list-style-type: none"><li>- Dow Corning Corp, Type 1-2577, 1-2577 LOW VOC. and Dow Corning Toray Co., Ltd., Type Pelgan Z.</li></ul> <p>Printed Wiring Boards.</p> <ul style="list-style-type: none"><li>- Yamashita Materials Corp. Type P1,</li><li>- Shoei Print Seisakusho Co., Ltd. Type 600 and 002,</li><li>- Tsuding Global Electronic Co., Ltd. Type HM5,</li><li>- Yamashita Materials Corp. Type P490,</li><li>- Leo Electronics Inc. Type 03V0,</li><li>- Shirai Denshi Kogyo Co., Ltd. Type M76E and MOO,</li><li>- Lung Wei Electronics Co., Ltd. Type 99,</li><li>- China Circuit Technology (Shantou) Corp. Type 5,</li><li>- Plotech Co., Ltd. Type 1,</li><li>- GG Circuits Industries Sdn. Bhd. Type D2 and 5,</li><li>- Milky-Way Printed Circuit Board Co Ltd Type MW-CEM3,</li><li>- Xine Electronics Co Ltd Type 2,</li><li>- Shanghai Wanzheng Circuit Board Co Ltd Type SWZ-3</li><li>- Kunshan Wanzheng Printed Circuit Board Co Ltd Type WZ-1-A.</li></ul>
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